

toxicity towards PBMCs from the healthy person at all the concentrations tested. Plants GHX-2, GHX-6, and GHX-7 slowed down the accelerated culture induced death of PBMCs from all four AIDS patients at noncytotoxic concentrations. Likewise, ddCyd and ddIno were effective in these patients except one AIDS patient where the two drugs failed to slow down the accelerated culture induced death of the PBMCs. The plant extracts therefore have the potential of slowing the accelerated death of PBMCs in HIV infected patients and thus restore immunocompetence.

## 12. Effects of plant extracts on bacteria growth.

In addition to viral opportunistic infections in the immunosuppressed, bacterial opportunistic infections, especially tuberculosis and Salmonella bacteremia, have become major medical problems in the immunosuppressed states like AIDS. In the absence of facilities to test the plant extracts against Mycobacterium tuberculosis in vitro, the extracts were tested against Staphylococcus aureus, Salmonella typhimurium, Klebsiella pneumonia, and an Edwardsiella species.

Various inoculi of bacteria were cultured in maintainance minimal essential medium without antibiotics in the presence of various concentrations of plant extracts. After 18 hrs of incubation, the tetrazolium-based colorimetry was done on the cultures. The O.D. readings from treated wells without bacteria were subtracted from O.D. readings from treated wells with bacteria. The results were expressed as percentages of control untreated wells with bacteria. These values were then plotted against the concentrations of plant extracts and the 50% inhibition concentrations determined.

Plant extracts GHX-8, X-20, and X-26 were invariably inhibitory to the bacteria tested (Table 11, 12, 13, and 14). Other plant extracts had minimal activities against bacteria. The ability of a drug to inhibit HIV and some opportunistic viruses and bacteria is an added advantage in the treatment of AIDS.

Drugs that act on only opportunistic viruses and bacteria would also be beneficial in combination therapies for AIDS.

13. Rationalized combination therapy against HIV infections.

Based on the foregoing examples, it would seem appropriate to combine extracts from different plants for maximum effects. Plants GHX-6 and GHX-27 (hereby designated group A) are most effective against HIV when treatment is started early after infection. Highly significant activities against HIV are however obtained for plants GHX-2 and GHX-26 (hereby designated group B) even in chronically infected cells. In addition, plant GHX-27 (hereby designated group C) selectively kills HIV/Molt4 chronically infected cells at concentrations with no effects on uninfected Molt4 cells. The different modes of action of the plants should allow for combinations with enhanced activities. Thus a combination of drugs selected from groups A (inhibitors of early viral events), B (inhibitors of late viral events), and C (a killer of HIV infected cells), would be ideal for treating HIV infections.

Plant	Antiviral*	Antibacterial*
GHX-2 ( <i>Ocimum gratissimum</i> )	+	+
GHX-4 ( <i>Sansevieria liberica</i> )	+	-
GHX-6 ( <i>Ficus polita</i> )	+	-
GHX-7 ( <i>Clausena anisata</i> )	+	-
GHX-8 ( <i>Rauwolfia vomitoria</i> )	-	+
GHX-20 ( <i>Combretum aphanopetalum</i> )	+	+
GHX-26 ( <i>Alchornea cordifolia</i> )	+	+
GHX-27 ( <i>Elaeophorbia drupifera</i> )	+	+

\* See tables 2 to 14 for specific viruses and bacteria used in tests.